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Project for a Europe-Africa permanent link through the Strait of Gibraltar

Note by the Secretary-General

1. The Secretary-General has the honour to transmit to the Economic and Social Council the report prepared in accordance with Council resolution 2003/52 by the Executive Secretaries of the Economic Commission for Europe and the Economic Commission for Africa on the work that has been done in connection with the project to establish a Europe-Africa permanent link through the Strait of Gibraltar (see annex).

2. The Economic and Social Council has taken an interest in this project since 1982 following a decision by the Governments of Morocco and Spain to carry out joint studies on the feasibility of the project as part of an agreement on bilateral cooperation adopted on 24 October 1980. Since then the Council has regularly requested the two regional commissions to keep track of the progress of studies relating to the project and to inform the Council of any developments.

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Annex

Project for a Europe-Africa permanent link through the Strait of Gibraltar: report on studies and activities carried out through the period 2003-2004

Summary

This report, drawn up jointly by the Economic Commission for Europe and the Economic Commission for Africa pursuant to Economic and Social Council resolution 2003/52 of 24 July 2003, describes inter alia the work carried out by the two research companies, the Sociedad Española de Estudios para la Comunicación Fija a través del Estrecho de Gibraltar (SECEG), and the Société Nationale d'Études du Détroit (SNED), in connection with the project for a permanent link through the Strait of Gibraltar. The work took place in the following areas: geodesy; oceanography; geo-prospecting; deep borehole drilling; and socio-economic research. The adoption in December 2003 of the programme of work for 2004-2006 gave a new impetus to the research and led to the resumption of deep drilling surveys. These surveys were in progress at the time this report was prepared. The survey results should help to clarify geological uncertainties regarding the central portion of the project's undersea route and determine its longitudinal profile, along with the construction strategies, first for the exploratory gallery envisaged in the basic alternative selected for the project, and then for the rail tunnel also envisaged in that basic alternative.

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I. Introduction

1. In its resolution 2003/52 of 24 July 2003, the Economic and Social Council requested the Executive Secretaries of the Economic Commission for Africa and the Economic Commission for Europe to continue to take an active part in the follow-up to the project for a Europe-Africa permanent link through the Strait of Gibraltar and to report to the Council at its substantive session of 2005.

2. This report, drawn up jointly by the two regional commissions based on information received from the two research companies, is in response to that request. It begins by giving a concise overview of the progress of studies at the end of 2002. This is followed by a brief description of the major activities carried out in 2003 and 2004, which constitutes the specific contribution of this follow-up report.

3. It should be recalled that studies for this project have been carried out pursuant to the bilateral agreements of 24 October 1980 and 27 September 1989 between the Governments of Morocco and Spain, under which the two parties undertook to conduct a joint study, on the basis of an equal sharing of the cost and under the authority of a permanent intergovernmental Joint Committee, of the feasibility of the project for a permanent link through the Strait of Gibraltar. The studies are conducted by two State companies: the Sociedad Española de Estudios para la Comunicación Fija a través del Estrecho de Gibraltar (SECEG), with headquarters in Madrid, and the Société Nationale d'Études du Détroit (SNED), with headquarters in Rabat.

4. After several phases and stages, the study process under way has, since 1996, focused on a basic alternative consisting of a tunnel structure drilled under the sill of the Strait, comprising two unidirectional railway galleries connected to a central service and safety gallery. The functional design, which is similar to that of the Channel Tunnel, allows for the interconnection of the two countries' railway networks and, in addition, the trans-shipment of road vehicles on shuttle trains between two terminals, one in Spain and the other in Morocco. The typical lengths of the structure are: 42 kilometres (km) between terminals; 37.7 km of tunnel; and 27.7 km of undersea tunnel.

5. For financial and technical reasons, the construction process is expected to take place in three successive phases, namely: (a) Phase 0, in which the undersea portion of the service and safety gallery would be constructed as an exploratory gallery for the structure; (b) Phase 1, in which the first railway gallery would be constructed, leading to single-tube operation of the project; and (c) Phase 2, in which the second railway gallery would be constructed to permit two-way operation when the traffic demand makes this necessary.

6. The location mapping of the tunnel route is currently the subject of a study of alternatives concerning the depth of the longitudinal profile in relation to the geology along a route in an area, based on where the water is at its greatest depth, midway between the two shores. However, for reasons linked, on the one hand, to the geological complexity of the site — study of which calls for drilling of deep boreholes in the seabed — and, on the other hand, to the difficulties of such deep borehole drilling owing to the exceptional pattern of currents in the Strait, the geological investigations in question are highly difficult and burdensome.

7. For this reason, in the study process for the permanent link through the Strait, a strong emphasis has been placed recently on the aforesaid geological investigations. This led to three deep drilling surveys, followed by a fourth, begun recently (see para. 15 below), which is intended to provide sufficient information leading to the selection of the pilot project route. The state of progress of the studies at the end of 2002, therefore, remained largely dependent upon additional large-scale geological surveys.

II. Project activities during 2003-2004

8. The thirty-fifth meeting of the Joint Committee, held in Madrid on 2 December 2003, adopted a work plan for 2004-2006, which led to the resumption of the study process. The plan's ultimate objective is to formulate the project and develop a financial and technical appraisal of it based on the information available in 2006, particularly as regards the updating of the engineering pilot project and the traffic forecasting models. The main activities carried out in the framework of the work plan are summarized below.

A. Geodesy

9. The Geodesic Network for Geodynamic Observations of the Strait, established in 1984 following extensive cooperation between the research companies and the specialized institutes of the two countries — in Spain, the Instituto Geográfico Nacional, and in Morocco, the Direction de la Cartographie — was reviewed and expanded several times before reaching its current configuration. It now comprises the 11 summits of the Spanish sub-network and the 11 summits of the Moroccan sub-network.

10. From 26 September to 1 October 2004, a long campaign of simultaneous observations of all the summits was carried out with a Global Positioning System (GPS) receiver assigned to each summit. Processing of the observation data will provide a basic geodesic framework for the project and allow the results to be incorporated into databases capable of detecting any geodynamic movements.

B. Oceanography

11. In order to improve the forecasting methods for the profile of marine currents on the sill of the Strait and improve the management of deep drilling operations in the sea, the companies took part in promoting and carrying out a research project on the hydrodynamic phenomena regulating the mixing of Atlantic and Mediterranean waters in the Strait and, in particular, those linked to the generation of internal waves capable of warranting corrections to forecast current values obtained from available methods, based mainly on harmonic analysis of the long series of available observations.

12. In the framework of an agreement with the University of Cádiz, the coordinating body for this research project, in which the universities of Málaga and Tangier are also participating, a campaign, dubbed the Mytilus Campaign, was carried out in November 2003. The data were captured by a set of reference current

meters anchored in the seabed and by a second set of instruments installed on an oceanographic vessel (*B/O Mytilus*). The processing of these data, now in progress, has already yielded practical results that can be utilized in short-term current forecasting, at least on an experimental basis.

C. Geo-prospecting

13. The strip on marine platforms facing south and north was the subject of numerous geological surveys during the period 1980-1995. This research plays a very important role in the geological nature of the project, for around two thirds of the undersea route of the structure is situated on these platforms. Taking into account the substantial progress made in prospecting technologies, the research companies carried out the 2004 Platforms Survey, the principal goal of which is to increase and update the information obtained previously.

14. The survey, carried out in October and November 2004 by the oceanographic vessel *B/O García del Cid*, resulted in, inter alia: (a) a geopositioned mosaic of sonographs covering the strip on the two platforms from about 1,000 km of sonar sidescan profiles; (b) a geophysical map of approximately the same zones from some 700 km of geo-wave (topographical) lines; and (c) a seabed sampling using a gravity sampler to help interpret the preceding sonic and seismic surveys. These results helped to enrich the available information while strengthening the geological nature of the project in the areas under study.

D. Deep borehole drilling

15. The most important activity undertaken during the reference period is the fourth borehole drilling survey in the Strait of Gibraltar, aimed at clarifying the geological uncertainties encountered in the central third of the layout. Although they concern a relatively modest length (around 2 km) of the structure, these uncertainties are a determining factor in the selection of its longitudinal profile and of the applicable construction strategies.

16. The fourth borehole drilling survey was launched by means of a contract signed in November 2004 in the framework of an open invitation for international tenders. It consists mainly of about 1,750 metres (m) of boreholes at sea at several sites in the area under study, using a dynamically positioned drilling vessel (*MSPOV Kingfisher*) equipped with a piggyback coring system and a re-entrable seabed system, which can eliminate or reduce the limitation of the drilling length inherent in the length of the tidal periods of currents navigable by the drilling vessel, as was the case in previous surveys. This innovation is reinforced by an additional measure which consists of having the survey standby vessel (*R/V E. Eva*) transmit to the drilling vessel, in real time, the current profiles it measures.

17. On the date of the preparation of this report, drilling is in progress with encouraging results, as regards both the technical performances, which have already surpassed those of previous surveys, and the attainment of certain anticipated geological objectives. One notable technical success consists of having recently achieved a drilling depth of over 300 m beneath a water segment of 280 m; this will substantially clarify the last remaining geological factors concerning the project route option.

E. Socio-economic research

18. Work under this heading has focused on maintaining the socio-economic and traffic databases in the project's region of influence, and on processing the origin/destination surveys of maritime trans-shipment traffic in the Strait and Morocco-Europe air traffic, with a view to incorporating the results of these surveys into the statistical databases of the revised project-user traffic forecasting model expected to be finalized during 2005.

III. Other project activities

A. Workshop on "Systematic Field Monitoring and Processing in Mechanized Tunnel Construction"

19. A technical workshop on "Systematic Field Monitoring and Processing in Mechanized Tunnel Construction", organized in 2004 in the framework of cooperation between the research companies, the Economic Commission for Europe and the International Tunnelling Association (ITA-AITES), was held in Madrid on 20 and 21 January 2005 with the participation of more than 40 experts from a dozen countries. This workshop was the fourth event organized in the framework of such cooperation.

20. The technical discussions, guided by three background reports and facilitated by 12 written communications, took place during three working sessions devoted, respectively, to geophysical monitoring (non-destructive), mechanical monitoring boreholes (auscultation drilling) and field analysis at each stage, focusing in particular on geological conditions similar to those of the tunnel under the Strait of Gibraltar. The technical committee of the workshop, including the authors of the background reports, was formed by ITA-AITES. The research companies were responsible for organizing the workshop and will see to the publication of the minutes.

B. Participation in European Commission research

21. As a member of the European Commission consortiums responsible for the studies — Defining and Evaluating a Strategic Transport Infrastructure Network in the Western Mediterranean (DESTIN) and Mediterranean and Trans-European Networks for Transport (MEDA TEN-T) — SNED produced a number of reports, including monographs on foreign trade in Moroccan goods and their land and maritime transport itineraries.

22. The DESTIN study is aimed, inter alia, at developing a traffic forecasting model in order to identify priority projects for the development of a strategic integrated transport network in the Western Mediterranean region. The MEDA TEN-T study examines the integration of transport systems in all of the Mediterranean countries by analysing the functioning of current networks and defining priority corridors and key projects for their development.

C. Events

23. In December 2003, on the occasion of the sixth high-level meeting between the Moroccan and Spanish Governments, held in Rabat, the two parties welcomed the adoption by the Joint Committee at its thirty-fifth meeting of the new work plan 2004-2006 concerning studies of the permanent link through the Strait, which would make it possible to resume the drilling of the project's exploratory gallery by 2008.

24. In January 2004 the companies made an initial presentation to the European Commission on the state of progress of the studies with a view to possible cooperation in the development of the project.

25. In December 2004 the thirty-sixth meeting of the intergovernmental Joint Committee was held in Rabat. Emphasis was placed on the fact that the project for a permanent link through the Strait of Gibraltar is incorporated into the Strategic Infrastructure and Transport Plan 2005-2020 pending approval by the Spanish Government, and on the agreement between the two parties to continue contacts with the European Union through a formal presentation of the project, taking into account the state of progress of the studies at the end of 2005 and the new planning and financing instruments for European Commission transport projects.

26. In January 2005, on the occasion of the State visit to Morocco by King Juan Carlos I and Queen Sofia of Spain, the aforesaid agreements were reaffirmed at the highest level and the state of progress of the project studies was presented to the monarchs at an audience held for that purpose by King Mohamed VI.

IV. Future work

27. Future work will centre on the implementation of the programme of work for 2004-2006. Special attention will be given to the fourth borehole drilling survey, in progress at the time this report was prepared, and to updating the basic engineering and user traffic forecasting studies, in order to formulate the technical and financial feasibility appraisal.

V. Conclusions

28. The adoption in December 2003 of the programme of work for 2004-2006 gave a new impetus to the research and led to the resumption of deep drilling surveys. The survey results should help to clarify geological uncertainties regarding the central portion of the project's undersea route and determine its longitudinal profile, along with the construction strategies, first for the exploratory gallery envisaged in the basic alternative selected for the project, and then for the rail tunnel also envisaged in that basic alternative.